ENDANGERED!

The Western Swamp Tortoise

by Dr. Andrew Burbidge

The Western Swamp Tortoise, *Pseudemydura umbrina*, often called the Short-necked Tortoise, is W.A.'s most endangered vertebrate. Fewer than 50 animals are known to exist.

The tortoises live in freshwater swamps that contain water only during winter and spring. When the swamps contain water the tortoises swim around feeding on small aquatic invertebrates. When the swamps dry they aestivate (go into torpor) in holes in the ground or under leaf litter. The females lay three to five hard-shelled eggs in a hole dug in the ground during late November or early December, and the eggs hatch the following May or June.

Wade Hughes

Why is this inoffensive reptile so endangered? Over 20 years of research have clarified the reasons for the present parlous situation, but as yet there are no easy answers to reversing the trend towards extinction.

The Western Swamp Tortoise has a biology different from other Australian tortoises. It is the smallest Australian tortoise and the reproductive potential is low. Most Australian tortoises lay two clutches per year, each of eight to thirty eggs.

Unlike most species, which live in permanent water, it inhabits only temporary clay swamps, a very restricted habitat. It seems that the total geographic range of the Western Swamp Tortoise at the time of European settlement was very small, being centred in the Swan Valley and extending from near Pearce to Perth airport. Most of this area was developed for agriculture many decades ago. Now the tortoise is known to occur only in two small nature reserves, Ellen Brook Nature Reserve at Upper Swan and Twin Swamps Nature Reserve at Warbrook.

Research has shown that these reserves contain only marginal habitat because the swamps do not fill for long enough to allow sufficient time for the tortoise to feed and grow. In dry years females do not get enough food to produce eggs and hatchlings do not survive because they do not grow large enough to withstand the drying out that occurs each summer. The slow growth rates mean that it takes from 10 to 20 years for them to reach sexual maturity, a very long time for such a small animal.

The final straw for the Western Swamp Tortoise was the arrival in W.A. of the European Red Fox. Foxes take a heavy toll of tortoises that aestivate under leaf litter, and also dig up and eat the eggs.

The combination of marginal habitat, a series of dry winters and predation by foxes has led to the virtual extinction of the population at Twin Swamps Nature Reserve, where aestivation takes place mostly in leaf litter. At Ellen Brook, where aestivation is mostly underground, foxes do not seem to have had the same effect, but the population has been unable to increase and remains at a very low number.

The future of the species may now rest with the development of techniques for captive breeding. This has not proved easy. Recently, CALM developed a research proposal to employ Dr Gerald Kuchling, an Austrian expert in tortoise reproduction, currently based at the University of W.A. The project will be jointly funded by CALM and the Australian National Parks and Wildlife Service, and an application for additional funds has been made to World Wildlife Fund Australia.

In addition, staff from CALM's Metropoliton region are attempting the daunting task of eliminating foxes from their reserves.

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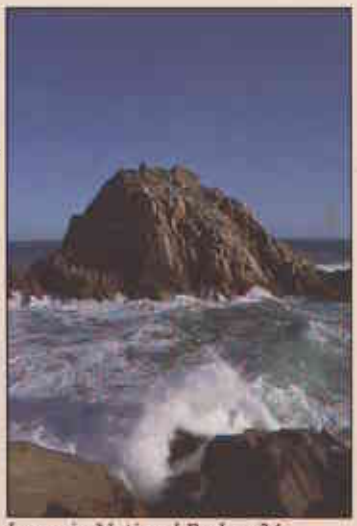

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Cover Photo
Trees loom out of the mist at Amelup near the Stirling Ranges. Photograph by Robert Karri-Davies.

EDITORIAL

The economic development versus environmental protection debate is a constant feature of our society today. No-one will disagree that our environment needs protection; there is also no doubt that Australia must improve its economic performance if we are to maintain our living standards and enjoy the natural environment which we are blessed with. This *Landscope* describes a project which combines environmental and economic advantages.

Australia's import bill for forest products is $1.7 billion. Of this a considerable portion is paper which is made from eucalypt fibre. A Perth scientist was the first person to demonstrate that eucalypt could be made into paper, yet it is other countries that have capitalised on this discovery. For example, Brazil, Portugal, Chile, South Africa and Spain have established over 3 million hectares of highly productive eucalyptus plantations. Australia, home of the genus Eucalyptus, has only 40 000 hectares of eucalyptus plantations.

Despite our late start, there is no reason why W.A. cannot share some of the rewards which would come from capitalizing on the increasing world demand for high quality paper. We have the land and climate to grow the trees and the skills to do it competitively.

Widespread afforestation of the south-west is also an essential prerequisite to ameliorating salination and eutrophication of our waterways. It is unlikely that afforestation of the magnitude required could be achieved unless it is commercially driven. The production of trees for paper could provide the opportunity to carry out the afforestation program necessary for improving the environment at no cost to the State.

It would be ironic if the world demand for the much maligned woodchip provided the solution for what would arguably be two of the most serious environmental problems in south-western Australia.